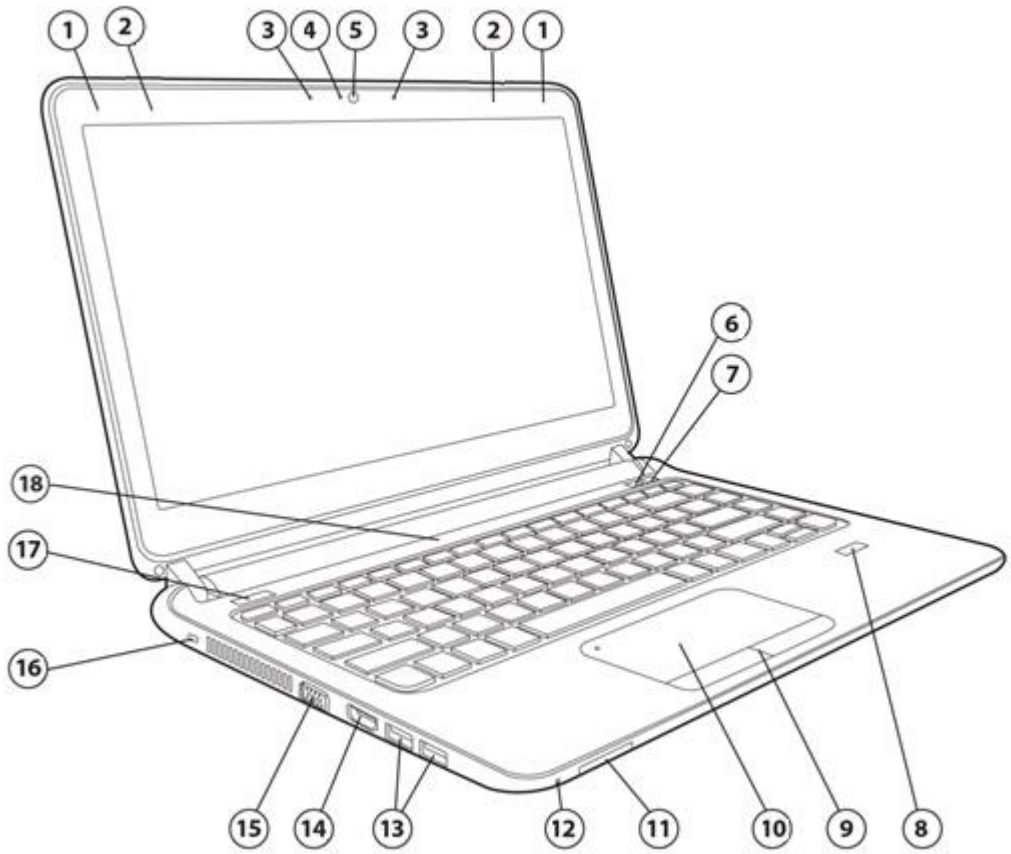
Overview

HP ProBook 430 G2 Notebook PC



Front

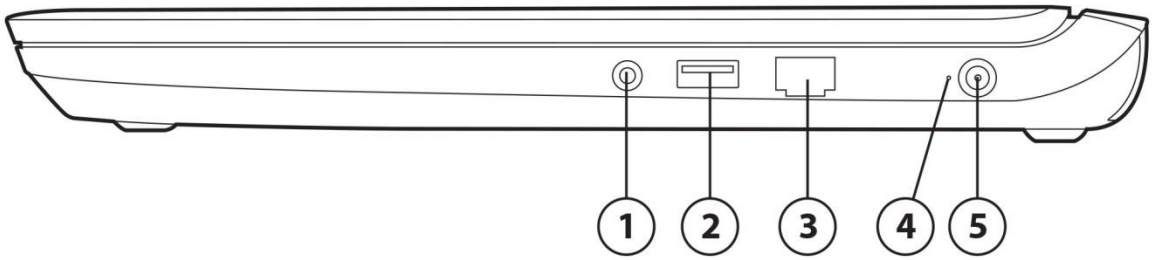
1. WLAN antennas (2)* (select models only)
2. WWAN antennas (2)** (select models only)
3. Dual-microphone array***
4. Webcam light***
5. Optional webcam
6. Wireless on/off button
7. Speaker mute button
8. Optional HP Fingerprint Reader
9. Touchpad pick buttons
10. Touchpad
11. Media Card Reader
12. Hard drive activity LED indicator
13. USB 3.0 ports (2)
14. HDMI port
15. VGA monitor port
16. Security lock slot
17. Power button
18. Speakers (2)

* The number of WLAN antennas in the displays is determined by the WLAN selected

** The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

*** Only available with optional webcam.

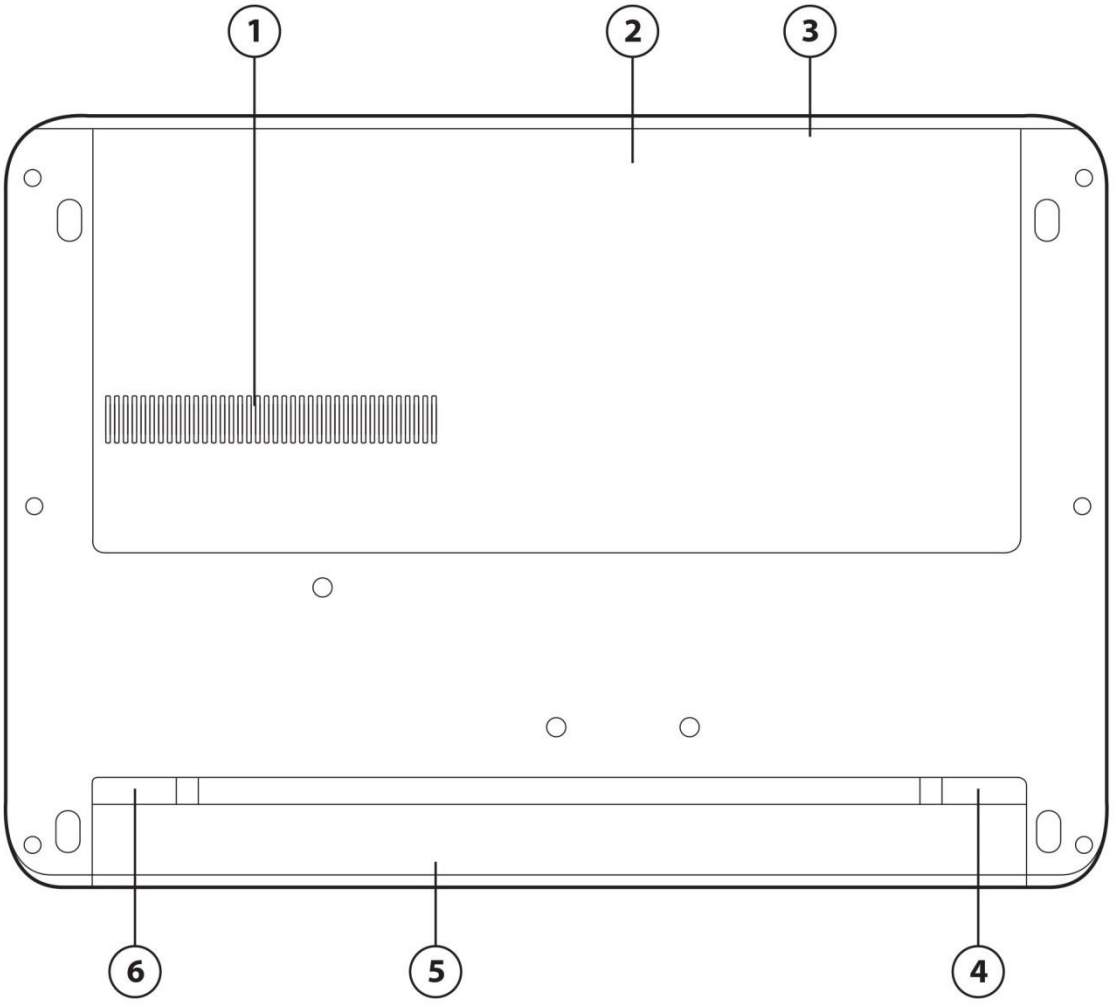
Overview



Right

1. Headphone/Microphone Combo Jack
2. USB 2.0 charging (powered) port
3. RJ-45 (network) jack
4. AC adapter/Battery light
5. Power connector

Overview



Bottom

1. Vent
2. SIM slot
3. Service door
4. Battery release latch
5. Battery bay
6. Battery release latch

Overview

AT A GLANCE

- Windows 8.1 versions, Windows 7 Professional (available through downgrade rights from Windows 8.1 Pro), Windows 7 versions, Ubuntu Linux or FreeDOS 2.0
- Lighter, durable multi-layer soft touch painted LCD cover and brushed aluminum keyboard deck help keep system looking good longer
- Full-sized, spill-resistant keyboard with a thin layer of Mylar film to prevent minor spills
- Larger Touchpad with gestures support, on/off button with LED indicator
- Enhanced security features including HP Client Security, optional HP Fingerprint Reader, TPM 1.2
- Optional HD webcam with dual-microphone array for video conferencing
- HDMI port for connecting to high-resolution displays; USB 3.0 ports
- DTS Sound+ optimized for high fidelity audio
- Widescreen LED-backlit HD display with 16:9 aspect ratio with 13.3 -inch diagonal HD screen and 13.3 -inch diagonal HD screen with Touch option (available in Summer 2014)
- Choice of 4th generation Intel® Dual-Core™ i7, i5, i3 and Celeron™ processors
- Wireless and speaker mute button to conveniently manage the connectivity and speaker.
- Flexible wireless connectivity options:
    - Integrated HP Mobile Broadband Module
    - Integrated 802.11 b/g/n wireless LAN module*
    - Integrated 802.11 a/b/g/n/AC , a/b/g/n or b/g/n with Bluetooth 4.0 combo card
- Spill-resistant backlit keyboard available on select models (available in Summer 2014)
- Optional 4-cell (40 WHr) HP Long Life battery

NOTE: See important legal disclosures for all listed specs in their respective features sections.

Features

PRODUCT NAME

HP ProBook 430 G2 Notebook PC

OPERATING SYSTEM

Preinstalled

Windows 8.1 Pro 64*
Windows 8.1 64*
Windows 7 Professional (available through downgrade rights from Windows 8.1 Pro)**
Windows 7 Professional 64***
Windows 7 Home Premium 64***
Windows 7 Home Basic 64***
Ubuntu Linux****
FreeDOS 2.0

* Not all features are available in all editions of Windows 8.1. Systems may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 8.1 functionality. See http://www.microsoft.com for details.
** This system is preinstalled with Windows® 7 Pro software and also comes with a license and media for Windows 8.1 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.
*** Not all features are available in all editions of Windows 7. This system may require upgraded and/or separately purchased hardware to take full advantage of Windows 7 functionality. See http://windows.microsoft.com/en-us/windows7/products/home for details.
**** Fingerprint reader, TPM, Touch display and WWAN are not suppotted

PROCESSOR

4th generation Intel® Dual-Core™ processors Core i7, i5, and i3

4th Generation Intel® Core™ i7-4510U (2.0GHz, 4 MB L3 cache, 2 cores)*
Up to 3.1GHz with Intel Turbo Boost Technology
4th Generation Intel® Core™ i5-4310U (2.0GHz, 3 MB L3 cache, 2 cores)*
Up to 3.0GHz with Intel Turbo Boost Technology
4th Generation Intel® Core™ i5-4210U (1.7GHz, 3 MB L3 cache, 2 cores)*
Up to 2.7GHz with Intel Turbo Boost Technology
4th Generation Intel® Core™ i3-4030U (1.9GHz, 3 MB L3 cache, 2 cores)*
4th Generation Intel® Core™ i3-4005U (1.7GHz, 3 MB L3 cache, 2 cores)* (Available in Summer 2014)
4th Generation Intel® Celeron 2957U (1.4GHz, 2MB L3 cache, 2 cores)*

* Multi-Core is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Intel's numbering is not a measurement of higher performance.
NOTE: Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

Features

GRAPHICS

Integrated:
4th Generation Intel® Core™ i7-4510U (2.0GHz, 4 MB L3 cache, 2 cores)/ Intel®HD Graphics 4400
4th Generation Intel® Core™ i5-4310U (2.0GHz, 3 MB L3 cache, 2 cores)/ Intel®HD Graphics 4400
4th Generation Intel® Core™ i5-4210U (1.7GHz, 3 MB L3 cache, 2 cores)/ Intel®HD Graphics 4400
4th Generation Intel® Core™ i3-4030U (1.9GHz, 3 MB L3 cache, 2 cores)/Intel®HD Graphics 4400
4th Generation Intel® Core™ i3-4005U (1.7GHz, 3 MB L3 cache, 2 cores)/Intel®HD Graphics 4400 (Available in Summer 2014)
4th Generation Intel® Celeron 2957U (1.4GHz, 2 MB L3 cache, 2 cores)/Intel®HD Graphics

DISPLAY

Internal
13.3” diagonal LED-backlit HD anti-glare (1366 x 768)
13.3" diagonal LED-backlit HD Touch Display is shatter, scratch, and smudge resistant (1366 x 768) (Available in Summer 2014)
External
Up to 32-bit per pixel color depth
VGA
Port supports resolutions up to 2048 x 1536 external resolution @50 Hz
HDMI
Supports direct connection to high-definition displays with up to 1920 x 1200@60Hz resolution and 7-channel audio with one convenient cable (not included)

NOTE: HD content required to view HD images.
NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.

STORAGE AND DRIVES

Primary Storage Bay
Hard Drives
320/500/750 GB*/1 TB* 5400 rpm SMART SATA HDD;
500 GB* 7200 rpm SMART SATA HDD
500 GB* 5400 rpm SMART SATA Hybrid SSHD with 8 GB NAND

Solid State Drives
120 GB* M.2 Solid State Drive
128/256 GB* 2.5” Solid State Drive

HP 3D DriveGuard (Windows only)
The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive

* For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16 GB (for Windows 7) and 36 GB (for Windows 8) of system disk is reserved for the system recovery software.

Features

OPTICAL DRIVES

External Optical Disk Drive

MEMORY

Standard
DDR3L 1.35V SDRAM (1600 MHz)
Two SODIMM slots supporting dual-channel memory
2 GB, 4 GB, and 8 GB SODIMMs
Maximum
Upgradeable to 16384 MB with optional 8192 MB SODIMMs in slots 1 and 2
Dual-channel
Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

NOTE: Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. With Windows Starter 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

NETWORKING/COMMUNICATIONS

Wireless
Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Broadband Wireless (WWAN) requires a Windows operating system and is available in select countries as a standard, factory configurable feature only. Integrated Bluetooth is also available (factory configurable only) and can be combined with any of the supported wireless LAN and wireless WAN options.

Broadband Wireless (WWAN)
HP hs3110 HSPA+ Mobile Broadband Module*,**
HP lt4112 LTE/HSPA+ Gobi™ 4G*,** Module*
Wireless LAN (WLAN)
Realtek RTL8188EE 802.11b/g/n (1x1) ***
Realtek RTL8723BE 802.11b/g/n (1x1) with Bluetooth® v4.0 combo***
Broadcom BCM943228HMB 802.11 a/b/g/n (2x2) with Bluetooth® v4.0 combo*
Intel Dual Band Wireless-AC 3160 802.11 a/b/g/n/ac (1x1) with Bluetooth 4.0 combo***
Intel Dual Band Wireless-AC 7260 802.11 a/b/g/n/ac (2x2) with Bluetooth 4.0 combo***
* Mobile Broadband is an optional feature and requires factory configuration. Use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Connection speeds will vary due to location, environment, network conditions, and other factors. 4G LTE not available on all products, and in all regions.
** 4G LTE not available on all products, and in all regions.
***Wireless access point and Internet service is required and is not included. Availability of public wireless access points limited.
Note: Supports Bluetooth® v2.1 on Linux operating systems.

Features

Communications
Realtek 10/100/1000*** Ethernet Controller

NOTE: Wireless use requires separately purchased service contract. Check with your local vendor for coverage area and availability in your area.
NOTE: Wireless access point and Internet service required. Availability of public wireless access points limited.

* The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

AUDIO/MULTIMEDIA

Audio
DTS Sound+
Integrated stereo speakers
Integrated digital microphone (dual-microphone array when equipped with optional webcam)
Function keys for microphone mute, volume up, and volume down
Headphone/Microphone Combo Jack
Webcam
Optional 720p HD* webcam

- HD format (widescreen)
- Supports videoconferencing (non-HD) and still image capture
- High quality fixed focus lens
- Video capture at various resolutions up to 1280x720 resolution (720p) and up to 30fps
- M-JPEG compression supports higher frame rates for video capture and videoconferencing
- Improved low light sensitivity
- Improved dynamic range
- Skype-ready **

* HD content required to view HD images.
** Not offered in China

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard
The HP spill-resistant keyboard and optional HP spill-resistant backlit keyboard are designed using a thin layer of Mylar film under the keyboard. The 101/102-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as editing keys, both left and right control and alt keys, and function keys. US and International key layouts are available. Optional backlit keyboard is available (available in Summer 2014).
Pointing Devices
Touchpad with gestures support, on/off button with LED indicator, two-way scroll, two pick buttons
Buttons and Function Keys
Separate launch buttons provide easy access to wireless on/off, and volume mute. Function keys provide control of features including: standby mode, display brightness, external display, microphone mute, volume down, volume up, and backlight toggle for backlit keyboard (select models only).

Features

SOFTWARE AND SECURITY

Software Included

	Windows 8.1	Windows 7
Security	Absolute Persistence Module[1]	Absolute Persistence Module[1]
	Device Access Manager with Just In Time Authentication	Device Access Manager with Just In Time Authentication
	HP File Sanitizer[2]	HP File Sanitizer[2]
	HP Client Security[3]	HP Client Security[3]
	HP SpareKey	HP SpareKey
	Microsoft Defender	Microsoft Security Essentials[4]
	DigitalPersona Fingerprint Driver	DigitalPersona Fingerprint Driver
	Validity Fingerprint Driver	Validity Fingerprint Driver
	Hardware Root of Trust	Hardware Root of Trust
	HP Automatic DriveLock	HP Automatic DriveLock
	HP BIOS Protection	HP BIOS Protection
	HP Disk Sanitizer[5]	HP Disk Sanitizer[5]
	DASH Support	DASH Support
	HP DriveLock	HP DriveLock
	HP SpareKey[6]	HP SpareKey[6]
	Hybrid Boot	Hybrid Boot
	Master Record Security	Master Record Security
	Measured Boot	Measured Boot
	Power On Authentication	Power On Authentication
	Pre-Boot Security	Pre-Boot Security
	Secure Boot (Windows 8.1)	Secure Boot (Windows 7)
	Secure Erase[7]	Secure Erase[7]
	Touch enabled F10 Setup with virtual KB	Touch enabled F10 Setup with virtual KB
MultiMedia	Cyberlink PowerDVD	Cyberlink PowerDVD
	Cyberlink YouCam BE	Cyberlink YouCam BE
Communications	HP Connection Manager	HP Connection Manager
	HP GPS and Location[8]	HP GPS and Location[8]
	HP Mobile Connect[9]	Intel WiDi Software[11]
	HP Wireless Hotspot[10]	Intel My WiFi and Wireless Drivers for Microsoft
	Intel WiDi Software[11]	
	Intel My WiFi and Wireless Drivers for Microsoft	
HP Value Add Software	Digital Energy Star Logo W8	Digital Energy Star Logo W8
	Getting Started with Windows 8	Getting Started with Windows 8
	HP 3D DriveGuard	HP 3D DriveGuard
	HP Ceement	HP Ceement
	HP ePrint Driver[12]	HP ePrint Driver[12]
	HP Hotkey	HP Hotkey
	HP PageLift App	HP PageLift App

Features

	HP PageLift for Win 7	HP PageLift for Win 7
	HP Recovery Manager	HP Recovery Manager
	HP Registration App	HP Registration App
	HP Setup	HP Setup
	HP Softpaq Download Manager	HP Softpaq Download Manager
	HP Software Setup	HP Software Setup
	HP Support Assistant[13]	HP Support Assistant[13]
	HP Recovery Disc Creator (HPRDC)	HP Recovery Disc Creator (HPRDC)
	HP WallPaper	HP WallPaper
	System Default Settings for Win8	System Default Settings for Win8
	UEFI System Diagnostics W8	UEFI System Diagnostics W8
3rd Party	Box 50GB Offer Desktop Icon[14]	Box 50GB Offer Desktop Icon[14]
	Box App	Box App
	Foxit PhantomPDF Express	Foxit PhantomPDF Express
	Buy Office	Buy Office

[1]The Absolute Persistence agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: http://www.absolute.com/company/legal/agreements/computrace-agreement. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.

[2]For the use cases outlined in the DOD 5220.22-M Supplement. Supports standard Hard Drives. Initial setup required.

[3]Not all features are remotely manageable.

[4]Opt in and internet connection required for updates.

[5]For the use cases outlined in the DOD 5220.22-M Supplement. Does not support Solid State Drives (SSDs). Initial setup required. Web history deleted only in Internet Explorer and Firefox browsers and must be user enabled.

[6]Requires initial user set up.

[7]For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88.

[8]GPS access requires an unobstructed path to multiple satellites. Performance may be affected if/when used inside of buildings, bridges or heavily congested metropolitan areas. Requires separately purchased GPS navigation software available from multiple GPS applications.

[9]Internet access required.

[10] The wireless hotspot application requires an active internet connection and separately purchased data plan. While HP wireless hotspot is active, on-device applications will continue to work and will use the same data plan as the wireless hotspot. Wireless hotspot data usage may incur additional charges. Check with your service provider for plan details. Requires Windows.

[11]Integrated Intel Wi-Di feature is available on select configurations only and requires separately purchased projector, tv or computer monitor with an integrated or external Wi-Di receiver. External Wi-Di receivers connect to the projector, tv or computer monitor via a standard HDMI cable, also sold separately.

[12]Requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter).Requires optional broadband module. Broadband use requires separately purchased service contract. Check with service provider for coverage and availability in your area. Separately purchased data plans or usage fees may apply. Print times and connection speeds may vary.

Features

[13] Internet access required.
[14] Offer available on new 2014 HP commercial PC and requires Box registration. Offer subject to change without notice.

Security

Standard
HP Client Security
Microsoft Defender
Drive Encryption*
HP BIOS Protection
Security lock slot
TPM 1.2 Embedded Security Chip

Optional
Intel Identity Protection**
HP Fingerprint reader
NOTE: The Computrace agent is shipped turned off, and must be activated by customers when they purchase a subscription. Subscriptions can be purchased for terms ranging from one to multiple years. Service is limited, check with Absolute for availability outside the U.S.

* HP Drive Encryption requires Windows. Data is protected prior to Drive Encryption login. Turning the PC off or into hibernate logs out of Drive Encryption and prevents data access.
** Intel Identity Protection feature is only available with Intel Core Processors. Intel® IPT security requires separate Symantec VIP software service subscription and must be activated and configured. Requires a website that uses Symantec VIP Authentication Service and Microsoft® Windows. Intel® and HP assume no liability for lost or stolen data and/or systems or any other damages resulting therefrom.

For more information on HP security solutions refer to: http://www.hp.com/go/security.

POWER

Power Supply
65W EM Smart AC Adapter
45W Smart AC Adapter
45W Smart AC Adapter (two prong) (Japan only) (1.0 m power cord only)
40W Smart AC Adapter (EMEA only)
Power cord included is 1.8m (+/- 0.1m) or 1.0m (+/- 0.1m) (1.8m power cord not available in Japan).
Primary Battery
4-cell (44 WHr) Lithium-Ion battery
4-cell (40 WHr) Long Life Lithium-Ion battery

Battery Life

	Configurations with integrated graphics
HP ProBook 430 G2	
4-cell (44 WHr) battery	Up to 9 hours 30 min*

Features

4-cell (40 WHr) long life battery Up to 8 hours 30 min*

*Windows 7 battery life will vary depending on various factors including product model, configuration, loaded applications, features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See www.bapco.com for additional details.

System Standby Time

4-cell (44 WHr) battery Up to 15 days**

4-cell (40 WHr) long life battery Up to 14 days**

**Standy life will vary depending on various factors including battery, Memory, CPU, EC and LAN chip. The maximum capacity of the battery will naturally decrease with time and usage.

Power Conservation

Supports enhanced Intel SpeedStep technology (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode)
Hibernation
Standby
ACPI compliance

WEIGHTS & DIMENSIONS

Weight

Starting at 3.31 lbs (1.50 kg)
Lightest possible configuration across battery and panel options (HD Panel, Non-Touch, 4-cell (44Whr) Battery, M.2 120GB SSD) at Lightest Weight Configurations (across panel, battery and ODD options, if applicable)

	4-cell (44Whr)
Non-Touch, M.2 SSD	3.31lb/1.50kg
Non-Touch, HDD	3.53lb/1.60kg
Touch, HDD	4.41lb/2.00kg

Dimensions (w x d x h)

Non-Touch Models

12.83 x 9.19 x 0.79-0.83 in (at rear and at front)
32.6 x 23.35 x 2.0-2.1c m (at rear and at front)

Touch Models

12.83 x 9.21 x 0.84 (front) - 0.89 in (rear)
32.6 x 23.40 x 2.13 (front) - 2.25 cm (rear)

NOTE: Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Starting weight requires optional 120GB M.2 SSD drive.

PORTS/SLOTS

Features

Ports
USB 3.0 – Two
USB 2.0 (powered port) – One
HDMI 1.4a – One
VGA – One
Headphone / Microphone Combo Jack – One
RJ-45 (Ethernet) – One
Power connector – One

Digital Media Slots
Multi Media Reader Slot supporting SD, SDHC, SDXC

SERVICE AND SUPPORT

HP Services offers limited 3-year, 1-year and 90-day warranty options depending on country; 1-year limited warranty on primary battery. 3-year limited warranty on HP Long Life Battery (only available with 3-year platform warranty).On-site service and warranty upgrades are also available. HP Care Pack Services extend service contracts beyond the standard warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/lookuptool. Additional HP Care Pack Services information by product is available at: http://www.hp.com/hps/carepack.
NOTE: Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details.
http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)	**Nominal Operating Voltage**	19 V
	Average Operating Power	19.19 W
	Max Operating Power	35.84W
Temperature	**Operating**	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)
	Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	**Operating**	10% to 90%, non-condensing
	Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
Shock	**Operating**	40 G, 2 ms, half-sine
	Non-operating	200 G, 2 ms, half-sine
Random Vibration	**Operating**	0.75 grms
	Non-operating	1.50 grms
Altitude (unpressurized)	**Operating**	-50 to 10,000 ft (-15.24 to 3,048 m)
	Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)
Planned Industry Standard Certifications	**UL**	Yes
	CSA	Yes
	FCC Compliance	Yes
	ENERGY STAR 6.0®	Select models*
	EPEAT	Registered Gold in United States**
	ICES	Yes
	Australia / NZ A-Tick Compliance	Yes
	CCC	Yes
	Japan VCCI Compliance	Yes
	KC	Yes
	BSMI	Yes
	CE Marking Compliance	Yes
	BNCI or BELUS	Yes
	CIT	Yes
	GOST	Yes
	Saudi Arabian Compliance (ICCP)	Yes
	SABS	Yes
	UKRSERTCOMPUTER	Yes

* Configurations of the HP ProBook 430 G2 that are ENERGY STAR qualified are identified as HP ProBook 430 G2 ENERGY STAR on HP websites and on www.energystar.gov.

** EPEAT registration varies by country. See www.epeat.net for registration status by country.
EPEAT status listed above applies to U.S.

For accessibility information on HP products, please visit: http://www.hp.com/accessibility.

Technical Specifications

DISPLAYS

13.3-inch LED HD (1366 x 768) anti-glare	**Active Area** (W x H)	11.53 x 6.49 in (29.3 x 16.5 cm)	
	Diagonal Size	13.3 in (33.8cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	400:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	**Pitch**	0.215 mm
		Format	1366 x 768
		Configuration	RGB Stripe
	Backlight	LED	
	PPI	118 ppi	
	Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)	

STORAGE AND DRIVES

Internal Storage			
500 GB* 7200 rpm SATA Hard Drive	**Drive Weight**	0.25 lbs (115g)	
	Capacity	500 GB	
	Height	0.276 in (7 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	**Single Track**	1.5 ms
		Average	11 ms
		Maximum	22 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
320 GB* 5400 rpm SATA Hard Drive	**Drive Weight**	0.22 lb (101 g	
	Capacity	320 GB	
	Height	0.276 in (7 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	300 MB/s (Drive Capability)
		Single Track	3 ms
		Average	13 ms

Technical Specifications

	Seek Time (typical reads, including settling)	**Maximum**	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	625,142,448	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
500 GB* 5400 rpm SATA Hard Drive	**Drive Weight**	0.22 lb (101 g)	
	Capacity	500 GB	
	Height	0.276 in (7 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	**Single Track**	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
750 GB* 5400 rpm SATA Hard Drive	**Drive Weight**	0.22 lb (101 g)	
	Capacity	750 GB	
	Height	0.276 in (7 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	300 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	**Single Track**	3 ms
		Average	13 ms
		Maximum	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	1,465,149,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
1 TB* 5400 rpm SATA Hard Drive	**Drive Weight**	0.254 lb (115 g)	
	Capacity	1 TB	
	Height	0.276 in (7 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	300 MB/s (Drive Capability)
		Single Track	3 ms
		Average	13 ms

Technical Specifications

	Seek Time (typical reads, including settling)	**Maximum**	24 ms
	Rotational Speed	5400 rpm	
	Logical Blocks	1,953,525,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
500 GB* 5400 rpm SMART SATA II Hybrid HDD/SSHD	**Drive Weight**	0.209 lb (95 g)	
	Capacity	500 GB	
	Height	0.276 in (7 mm)	
	Width	2.76 in (70.1 mm)	
	Interface	ATA-8, SATA 2.6, 6.0 Gb/s, NCQ	
	Transfer Rate	**Synchronous** (maximum)	600 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	**Single Track**	2 ms
		Average	12 ms
		Maximum	NIL ms
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	
SATA 6 Gb/s 128 GB*, 2.5-inch Solid State Drive	**Drive Weight**	73 Grams	
	Capacity	128 GB	
	Height	0.276 in (7 mm)	
	Width	2.76 in (70 mm)	
	Interface	SATA 3 (6 Gb/s)	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		415 MB/s	175 MB/s
	Logical Blocks	250,069,680	
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
	Features	ATA Security; ATA-8; SATA 3.0; DIPM; TRIM	
120 GB* M.2 Solid State Drive	**Drive Weight**	< 10 Grams	
	Capacity	120 GB	
	Height	0.276 in (22 mm)	
	Width	2.76 in (42 mm)	
	Interface	SATA 3 (6 Gb/s)	
	Performance	**Maximum Sequential Read**	**Maximum Sequential Write**
		540 MB/s	480 MB/s
	Logical Blocks	234,441,648	
	Operating Temperature	32° to 158°F (0° to 70°C) [case temp]	
	Features	ATA Security; ATA-8; SATA 3.0; TRIM	

Technical Specifications

* For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB (for Windows 8) of system disk is reserved for system recovery software.

SECURITY

HP Fingerprint Reader (optional)	**Mobile Voltage Operation**	3.0V-3.6V Single Supply
	Operating Temperature	32° – 158°F (0° – 70°C)
	Current Consumption @ 3.3V	Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management
	High-Rate Image Capture	Up to 240 image frames /sec
	ESD Resistance	IEC 61000-4-2 Level 4 (±15KV)
	Detection Matrix	192 x 16 Pixels 9.7 mm x 0.81 mm 500 ppi High-Resolution Images

NETWORKING/COMMUNICATIONS

Integrated Realtek RTL8161GSH-CH 10/100/1000 NIC	**Ethernet Features**	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3ab; IEEE 8023 clauses 40) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) IEEE 802.3az EEE (Energy Efficient Ethernet) Jumbo Frame 9K Auto MDI/MDIX Crossover cable detection
	Power Management	ACPI compliant - multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
	Performance Features	TCP/IP/UDP Checksum Offload (configurable) Protocol Offload (ARP & NS) Large send offload and Giant send offload Receiving Side Scaling
	Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
	Interface	PCI Express 1.1to fully support ASPM L0s/L1 and CLKREQ
	NIC Device Driver Name	Realtek PCIe GBE Ethernet Family Controller

Technical Specifications

HP hs3110 HSPA+ Mobile Broadband Module*	**Technology/Operating Bands**	CDMA/1xRTT/EvDO: 800MHz (Cell), 1900MHz (PCS) GSM/GPRS/EDGE: 850MHz (Cell), 900MHz (EGSM), 1800MHz (DCS), 1900MHz (PCS) UMTS/WCDMA with receive diversity: 2100MHz (UTRA FDD Band I), 1900MHz (UTRA FDD Band II), 900MHz (UTRA FDD Band VIII), 850 MHz (UTRA FDD Band V) LTE: 700 MHz (Verizon, Band XIII)
	Mobile Operator	Verizon (US only)
	Wireless Protocol Standards	GSM/GPRS/EDGE: Class B, Multi-slot class 10 operation, coding schemes CS1 - CS4 and MSC1 - MSC9. CDMA: 1xEVDO Release 0 and Release A, IS-95A, IS-95B, IS-856, IS-2000 UMTS/WCDMA: Release 99 and Release 7 LTE: Power Class III as per 3GPP TS 36.101
	Wireless Parametric Standards	Complies with 3GPP specifications Release 8 for LTE
	Maximum Data Rates	EvDO (Revision A) - 3.1 Mbps (Download), 1.8 Mbps (Upload) WCDMA (DC-HSPA+) - 42Mbps (Download) LTE (Category 3) - 100 Mbps (Download), 50Mbps (Upload)
	GPS	Standalone, Assisted, XTRA
	GPS Bands	1575.42 MHz (± 1.023 MHz)
	Maximum Output Power	GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+0.7/-2.3) LTE: +23 dBm (+2.7 dBm/-1.7 dBm) 1xRTT/EvDO: +24 dBm (+0.5 dBm/-1.5 dBm)
	Maximum Power Consumption	2700mA (peak)
	Power Consumption, Sleep Mode	10 mA
	Power Management	USB selective suspend Integrated notebook wireless button
	Antenna Type	Dual high efficiency 6 band antennae with spatial diversity, mounted in the display enclosure
	Form Factor	PCI-Express MiniCard, USB 2.0 interface
	Weight	< 10 g
	Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 4.5 mm)
	Voltage, Operating	3.3v +/- 9%
	Temperature, Operating	-4° to 149° F (-20° to 65° C)
	Temperature, Non-operating, 96 hours (from MIL-STD 202 Method 108)	-40° to 185° F (-40° to 85° C)
	Humidity, Non-operating	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	LED Activity	LED Off - Radio Off; Solid LED On - Radio On

Technical Specifications

* Mobile Broadband is an optional feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors.

HP lt4112 LTE/HSPA+ Gobi™ 4G Module*	**Technology/Operating bands**	LTE FDD all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 2600 MHz (Band VII), 900 MHz (Band VIII), 700 MHz (Band XX, DD800) WCDMA/HSDPA/HSUPA/HSPA+ all bands with diversity: 2100 MHz (Band I), 1900 MHz (Band II), 800 MHz (Band V), 900 MHz (Band VIII) GSM/GPRS/EDGE: 1900 MHz (Band II), 1800 MHz (Band III), 850 MHz (Band V), 900 MHz (Band VIII)
	Wireless protocol standards	3GPP Release 8 LTE Specification WCDMA R99, 3GPP Release 5, 6 and 7 UMTS Specification
	Wireless parametric standards	Complies with 3GPP specifications Release 8 for LTE
	Maximum data rates	LTE (Category 3): 100 Mbps (Download), 50Mbps (Upload) DC-HSPA+: 42 Mbps (Download), 5.76 Mbps (Upload) HSPA+: 21.6 Mbps (Download), 5.76 Mbps (Upload) EDGE: 236.8 kbps (Download), 236.8 kbps (Upload) GPRS: 85.6 kbps(Download), 85.6 kbps (Upload)
	GPS	Standalone
	GPS bands	1575.42 MHz (± 1.023 MHz), GLONASS 1596-1607MHz
	Maximum output power	LTE: +23 dBm (+/- 2 dBm) WCDMA: +23.5 dBm (+/- 1 dBm) GPRS Band II, III: +29.5 dBm (+/- 1 dBm) GPRS Band V, VIII: +32.5 dBm (+/- 1 dBm) EGPRS Band II, III: +26.5 dBM (+/-1.5 dBm) EGPRS Band V, VIII: +27.5 dBM (+/-1.5 dBm)
	Maximum power consumption	LTE: 1,200 mA (peak); <900 mA (average) WCDMA: 1,100 mA (peak); <800 mA (average) EGPRS: 2,800 mA (peak); <700 mA (average)
	Power consumption, sleep mode	3 mA
	Power management	USB selective suspend, Integrated notebook wireless button
	Antenna type	Dual high efficiency multi-band antennae with spatial diversity
	Form Factor	M.2, USB 2.0 interface
	Weight	6 g
	Dimensions (Length x Width x Thickness)	42 mm × 30 mm × 2.3 mm
	Voltage, Operating	3.135 V to 4.4 V (3.3 V +1.1V/-0.165V)
	Temperature, operating (from TIA/EIA/IS-98-D)	14° to 131° F (–10° to 55° C)
	Temperature, non-operating, 96 hours (from MIL-STD 202 Method 108)	–40° to 185° F (–40° to 85° C)
	Humidity, non-operating	95% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)

Technical Specifications

	LED activity	LED Off - Radio Off; Solid LED On - Radio On

* Mobile Broadband is an optional feature. Connection requires wireless data service contract, network support, and is not available in all areas. Contact service provider to determine the coverage area and availability. Connection speeds will vary due to location, environment, network conditions, and other factors.

Realtek 802.11 b/g/n (1x1)	**Wireless LAN Standards**	IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified
	Frequency Band	2.402 – 2.482 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: card will support rates for NSS=1 for RX and TX for 20 MHz channels. Short and long guard interval will be supported.
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM
	Security[1]	IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only AES-CCMP: 128 bit in hardware 802.1x authentication types WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. WPA2 certification IEEE 802.11i Cisco Certified Extensions, all versions through V5 WAPI
	Network Architecture	Ad-hoc (Peer to Peer)
	Models	Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power[2]	13.5 dBm, nominal
	Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Associated to Access Point, Idle: 250 mW nominal Wireless Button Off: 100 mW nominal Radio disabled: 75 mW nominal
	Power Management	ACPI compliant power management 802.11 compliant power saving mode
	Receiver Sensitivity[3]	802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps) 802.11g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps) 802.11n:-70dBm (72.2 Mbps)
	Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure
	Form Factor	PCI-Express Half-MiniCard
	Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
	Operating Voltage	3.3v +/- 9%

Technical Specifications

	Temperature	Operating	14° to 158° F (–10° to 70° C)
		Non-operating	–40° to 176° F (–40° to 80° C)
	Humidity	Operating	10% to 90% (non-condensing)
		Non-operating	5% to 95% (non-condensing)
	Altitude	Operating	0 to 10,000 ft (3,048 m)
		Non-operating	0 to 50,000 ft (15,240 m)
	LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Broadcom 802.11a/b/g/n (2x2) + Bluetooth™ 4.0 combo

Wireless LAN Standards
IEEE 802.11a
IEEE 802.11b
IEEE 802.11g
IEEE 802.11n

Interoperability
Wi-Fi certified

Frequency Band
802.11b/g/n
- 2.402 – 2.482 GHz

802.11a/n
- 4.9 – 4.95 GHz (Japan)
- 5.15 – 5.25 GHz
- 5.25 – 5.35 GHz
- 5.47 – 5.725 GHz
- 5.825 – 5.850 GHz
- 2.402 – 2.482 GHz

Data Rates
802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11b: 1, 2, 5.5, 11 Mbps
802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
802.11n: card will support rates for NSS=1 and NSS=2 for RX and TX for 20 and 40 MHz channels. Short and long guard interval shall be supported.

Modulation
Direct Sequence Spread Spectrum
BPSK, QPSK, CCK, 16-QAM, 64-QAM

Security[1]
- IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only
- AES-CCMP: 128 bit in hardware
- 802.1x authentication
- WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.
- WPA2 certification
- IEEE 802.11i
- Cisco Certified Extensions, all versions through V5
- WAPI

Network Architecture
Ad-hoc (Peer to Peer)

Models
Infrastructure (Access Point Required)

Roaming
IEEE 802.11 compliant roaming between access points

Output Power[2]	• 2.4G: +13.5dBm minimum • 5G: +12dBm minimum • Maximum output power must be able to achieve modular regulatory certification with notebooks that have antennas >20cm from the user and peak gain of +3dBi at 2.4GHz and +4dBi at 5GHz
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 250 mW (WLAN Associated) Idle mode: 100 mW (WLAN unassociated) Radio disabled: 75 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	802.11b:-95 dBm (1 Mbps), -93 dBm (2 Mbps), -91 dBm (5.5 Mbps), -88 dBm (11 Mbps) 802.11a/g:-90 dBm (6 Mbps), -89 dBm (9 Mbps), -87 dBm (12 Mbps), -85 dBm (18 Mbps), -82 dBm (24 Mbps), -79 dBm (36 Mbps), -76 dBm (48 Mbps), -74 dBm (54 Mbps) 802.11n:-69 dBm (72.2 Mbps), -66 dBm (300 Mbps)
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express Half-MiniCard
Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)
Operating Voltage	3.3v +/- 9%
Temperature	Operating 14° to 158° F (–10° to 70° C) Non-operating –40° to 176° F (–40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)
Altitude	Operating 0 to 10,000 ft (3,048 m) Non-operating 0 to 50,000 ft (15,240 m)
LED Activity	LED Off – Radio OFF; Solid LED On – Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Bluetooth Specification	
V4.0 High Speed, V2.1+EDR, backwards compatible with V1.1, 1.2 and 2.0	
Number of Available Channels	79 (1 MHz) available channels
Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps

	Synchronous Connection Oriented links up to 3, 64 kbps, voice channels
	Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
Transmit Power	-6 dBm to 4 dBm (Bluetooth Class II)
Receiver Sensitivity	Better than -80 dBM at 0.1 % raw bit error rate
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Sleep <17 mW
Antenna	Internally integrated within module
Range	Up to 33 ft (10 m)
Electrical Interface	USB 2.0 compliant Microsoft Windows Plug and Play compliant
Bluetooth Software Supported	Broadcom Bluetooth for Windows Microsoft Windows Bluetooth Software
Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves
Security	Full support of Bluetooth Security Provisions
Power Management	Microsoft Windows ACPI, and USB Bus Support Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff
Certifications	All necessary regulatory approvals for supported countries, including: FCC (47 CFR) Part 15C, Section 15.247 & 15.249 ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	Generic Access Profile (GAP) Service Discovery Application Profile (SDAP) Serial Port Profile (SPP) Dial_Up Networking Profile (DUN) Generic Object Exchange Profile (GOEP) Object Push Profile (OPP) File Transfer Profile (FTP) Synchronization Profile (SYNC) Hard Copy Cable Replacement (HCRP) Personal Area Networking Profile (PAN) Human Interface Device Profile (HID) Generic Audio/Video Distribution Profile (GAVDP) Advanced Audio/Video Distribution Profile (A2DP) FAX Profile (FAX) Basic Imaging Profile (BIP) Headset Profile (HSP) Hands Free Profile (HFP) Basic Printing Profile (BPP) VDP (Video Distribution Profile) AVRCP (Audio Video Remote Control Profile)

Technical Specifications

AUDIO/MULTIMEDIA - DTS SOUND+

Hardware	**Implementation**	Realtek ALC3227-CG
	Function Key Volume Controls	Volume up, volume down, and mute
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes, dual digital microphone array
Audio Output Quality	**Frequency Response**	10 Hz – .454*Fs
	Signal to Noise Ratio	95 dB (DAC), 88dB (ADC)
	Total Harmonic Distortion	0.01%
	Play/Record Sampling Rate(s)	44.1k/48k/96k/192kHz
	DAC	16, 20 or 24-bit
	ADC	16, 20 or 24-bit
Integrated Stereo Speakers	**Power Rating**	2 Watts
	Impedance	4 Ohms

POWER

HP 65W EM Smart AC Adapter	**Dimensions**	4.98 x 1.97 x 1.18 in (12.65 x 5.0 x 3.0 cm)	
	Weight	0.62 lb (290 g) max	
	Input	90 to 265 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC
	Output	Output power	65W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%

	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition.	
HP 45W Smart AC Adapter	**Dimensions**	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)	
	Input	90 to 265 VAC	
		Input Efficiency	87.74% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	2.31 A at 100 VAC and maximum load
	Output	**Output power**	45W
		DC output	19.5V +5.0%/-5%
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<8A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	**Operating temperature**	32° to 95° F (0° to 35° C)
		Non-operating (storage) temperature	-4° to 121° F (-20° to 85° C)
		Altitude	0 to 16,405 ft (0 to 5,000 m)
		Humidity	0% to 95%
		Storage Humidity	0% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; Reliability - failure rate of less than 0.1% annually within the first three years of operation.	

HP 40W Smart AC Adapter	**Dimensions**	3.67 x 1.57 x 1.18 in (93 x 40 x 30 mm)
	Weight	8.64 oz (245 g)
	Input	90 to 265 VAC
	Input Efficiency	84% min at 115 VAC
	Input frequency range	47 to 63 Hz
	Input AC current	1.1 A at 90 VAC
	Output	
	Output power	40W
	Output Voltage	19.5V +5.0%/-5.0%
	Output current limit	3.08A
	Environmental design	
	Operating temperature	32° to 95° F (0° to 35° C)

	Non-operating (storage) temperature	-4° to 185° F (-20° to 85° C)
	Altitude	
	Humidity	Up to 95%
	Storage humidity	Up to 95%
	EMI and safety certifications	Worldwide safety and EMC approvals including CE, UL, cUL, GS, Australian Electric Permit, RCM, NOM, CCC, KC, CU, S mark, BSMI, ISC, PSE, PSB, NRcan, Ukraine and SII

4-Cell (44 WHr) Lithium-Ion battery	**Dimensions** (H x W x L)	0.86 x 1.4 x 8.0 in (2.18 x 3.56 x 27.72 cm)	
	Weight	≤0.551 lb (250 g)	
	Cells/Type	4-cell Lithium-Ion	
	Energy	Voltage	14.8V DC
		Amp-hour capacity	2850mAh
		Watt-hour Capacity	44 WHr
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (–10° to 60° C)
		Non-operating	–4° to 140° F (–20° to 60° C)
	Battery Re-Charge Time	System in OFF mode or Standby	2.5 hours
		System ON	3 to 5 hours (depending on system power consumption)
	Fuel Gauge LED	No	
	Warranty	1 year	
	Optional Travel Battery Available	No	
4-cell (40 WHr) Long Life Lithium-Ion battery	**Cells/Type**	4-cell Lithium-Ion	
	Energy	Watt-hour Capacity	40 WHr
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (–10° to 60° C)
		Non-operating	–4° to 140° F (–20° to 60° C)
	Battery Re-Charge Time	System in OFF mode or Standby	2.5 hours
		System ON	3 to 5 hours (depending on system power consumption)
	Fuel Gauge LED	No	
	Warranty	3 years	
	Optional Travel Battery Available	No	

ENVIRONMENTAL DATA

Technical Specifications

Eco-Label Certifications & declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- US ENERGY STAR®
- EPEAT <Gold> registered in the United States. See http://www.epeat.net for registration status in your country.

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".

Energy Consumption (in accordance with US ENERGY STAR® test method)	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 60Hz**
Normal Operation (Short idle)	7.91 W	7.91 W	8.42 W
Normal Operation (Long idle)	6.05 W	6.49 W	5.78 W
Sleep	0.71 W	0.74 W	0.71 W
Off	0.37 W	0.40 W	0.37 W

Note:
Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 60Hz**
Normal Operation (Short idle)	27 BTU/hr	27 BTU/hr	29 BTU/hr
Normal Operation (Long idle)	21 BTU/hr	22 BTU/hr	20 BTU/hr
Sleep	2 BTU/hr	3 BTU/hr	2 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr

*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)

Technical Specifications

Typically Configured – Idle	3.1	24
Fixed Disk – Random writes	3.1	24

Longevity and Upgrading

This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:

- 3 USB ports
- 1 PC card slot (type I/II)
- 1 ExpressCard/54 slot
- 1 IEEE 1394 Port
- 2 SODIMM memory slots
- Optional expansion base docking station
- 1 multi-bay II storage port
- Interchangeable HDD

Spare parts are available throughout the warranty period and or for up to "5" years after the end of production.

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the <gold> level, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product contains 0% post-consumer recycled plastic (by wt.)
- This product is xx.x% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	387.8 g
Internal:	PLASTIC/Polyethylene low density	55.6 g

The plastic packaging material contains at least 75% recycled content.
The corrugated paper packaging materials contains at least 75% recycled content.

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (for reference of these limits please refer to the HP General Specification of the Environment(http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde

- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Nickel finishes that release greater than 0.5 µgrams/cm2/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

Packaging Usage

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:
Global Citizenship Report
http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html
Environment website
http://www.hp.com/environment
Eco-label certifications
http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html
ISO 14001 certificates:
http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

Country of Origin

China

Options and Accessories (sold separately and availability may vary by country)

Type	Description	Part #
Cases	HP Essential Top Load Case	H2W17AA
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Essential Messenger Case (up to 17.3")	H1D25AA
Docking	HP 3005pr USB 3.0 Port Replicator	H1L08AA
Input/Output – Mice	HP Comfort Grip Wireless Mouse	H2L63AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Optical Travel mouse	RH304AA
Adapters	HP 45W Smart AC Adapter 4.5mm	H6Y88AA
Security	HP UltraSlim Keyed Cable Lock	H4D73AA
Displays	HP ProDisplay P201 20-inch LED Backlit Monitor	C9F26AA
	HP ProDisplay P201m 20-inch LED Backlit Monitor (With Integrated Speakers)	C9F73AA
	HP ProDisplay P221 21.5-inch LED Backlit Monitor	C9E49AA
	HP ProDisplay P231 23-inch LED Backlit Monitor	E4S07AA

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Options and Accessories (sold separately and availability may vary by country)

Summary of Changes

Date of change:	Version History:		Description of change:
June 9, 2014	From March14 to June14	Added	Environmental data, change log
June 19, 2014	From June 9 June 19	Added	Battery life and changes throughout the document. Added cNumber, date, version number
July 7, 2014	From v4 to v5	Changed	Weights specs